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Recommended Citation

Pahnila, Seppo and Warsta, Juhani, "Assessing The Factors That Have An Impact On Stickiness In Online Game Communities" (2012). *PACIS 2012 Proceedings*. 106.

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ASSESSING THE FACTORS THAT HAVE AN IMPACT ON STICKINESS IN ONLINE GAME COMMUNITIES

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Abstract

How to attract players has been of interest to practitioners, online game designers and game site constructors. The objective of this research is to explore factors that effect stickiness in online game communities. This study applies social cohesion theory, social identity theory and motivational theory to propose a research model. Structural equation modeling results indicate that stickiness is influenced by social cohesion, playfulness and habit. In addition, social identification, social need and offline social interaction have a significant impact on social cohesion. Practical implications and limitations are also discussed.

Keywords: online game, gaming, stickiness, social cohesion, community

1 INTRODUCTION

A virtual online gaming community is one example of multifarious social communities such as gaming, discussion, chat, information sharing, and other interactive services mushrooming throughout the Internet (Antikainen 2007). Interpersonal virtual online gaming is becoming the most important way of using the Internet (Cummings et al. 2002). In the physical world, people communicate with each other by speaking face-to-face, whereas in a virtual environment, people communicate using mostly written words, voice, or animation (Bagozzi et al. 2002). Bagozzi and Dholakia (2002) suggested that virtual communities, which are organized around a distinct interest or community, may grow because community members feel that they have strong bonds or want to separate themselves from non-members.

Although stickiness has been of interest to social scientists and practitioners alike, for game designers and game site constructors, there is a lack of research focused on stickiness in online game communities. The objective of this research is to explore factors that affect stickiness in online gaming communities. To assess the factors that impact stickiness in game communities, the study explores the following variables: social identification, social need and offline social interaction explaining social cohesion, further social cohesion, playfulness, habits explaining stickiness by adapting social cohesion theory, social identity theory (Birnie et al. 2002; Friedkin 2004; Tajfel 1974), and the motivational framework. Findings suggest that social cohesion, playfulness, and habit have a significant influence on stickiness.

This paper is organized as follows: in the next section, we discuss issues that may have influence stickiness, based on a review of prior literature. In the following section, we describe the research methodology, data collection procedures, and results of the study. In the final sections, we summarize the limitations and results of the study.

2 THEORETICAL BACKGROUND

2.1 Stickiness

The interesting question facing online markets today is, what are the components of the glue that sustains online gamers' positive attitudes toward the gaming experience and makes gamers stay on and return to a specific gaming community site? Furthermore, which online features provide and encourage stickiness? Generally, research regarding the role of stickiness in the online game environment is lacking. In a web environment, stickiness is associated with brand loyalty, user satisfaction, and personalization (Holland et al. 2001). Holland and Baker (2001, 37) defined stickiness as "the sum of all the web site qualities that induce visitors to remain at the site rather than move on to another site." In turn, Telang and Mukhopady (2005) defined stickiness as the length of portal use. They found that loyal users tend to spend more time on a site. Repeat use also has a positive impact on stickiness. In this study, we consider stickiness as an individual's involvement with and loyalty to the site and an intention to continue to use the site.

Gamers may enjoy playing online games because they can easily compare the properties of different games and services attached to these games. Earlier positive experiences of online games sites, preferences, and a service provider's good reputation encourage the gamer to patronize the online game site. If users revisit the site and their visits last a long time, these characteristics may indicate that users are committed to that site. From the point of view of the service provider, it is essential to try to get gamers to visit the site, to keep the user on the site, and to get the user to revisit the site.

From the business viewpoint, online game developers try to attract users and increase their involvement level with the site. Therefore, online game developers should offer gaming experiences and services that are interesting, topical, and easy and quick to find.

2.2 Playfulness

Moon and Kim (2001) found that if a system is used for entertainment purposes, perceived playfulness (enjoyment) has a more significant effect on intention to use the system than perceived usefulness. They suggested that playfulness includes trait, which refers to a comparatively stable motivational characteristic of individuals, and the state, which refers to an affective or cognitive situational characteristic of the interaction between an individual and the situation. The interaction state of playfulness has been referred in the literature as a “state of flow” when the individual finds the interaction intrinsically playful and interesting and the person is involved in the activity for pleasure (Csikszentmihalyi 2000). People play games for fun or to satisfy their desire for entertainment; therefore, playfulness can be the major reason that attracts players to participate in playing games and may cause them to repeat the activity (Chou and Ting 2003; Lu and Wang 2008). When a player has experienced a sense of playfulness when playing online games, he or she might repeatedly seek the optimal experience; then the possibility of developing game addiction and stickiness is likely to be higher (Lu and Wang 2008).

Lu and Wang (2008) studied the factors that affect online game addiction and loyalty. They found that perceived playfulness has an impact on online game addiction. Furthermore, descriptive norms indirectly affect online game addiction through perceived playfulness. Addiction also directly contributes to loyalty and attenuates the relationship between satisfaction and loyalty.

Hsu and Lu (2007, 1647) defined playfulness (or enjoyment) as “the extent to which the activity of participating in the online game community is perceived to be pleasure and satisfaction.” They found that perceived playfulness strongly influenced individuals’ preference and loyalty in online games. Therefore, this study considers playfulness an intrinsic feeling or motive that arouses positive attitude toward the environment and strengthens the individual’s interaction with the environment.

Research has shown that playfulness is an important motivational factor that influences an individual’s attitude and behavior. Individuals use technology because it is enjoyable; it offers fun and the feeling of satisfaction. We believe that playfulness is a component of a game that sticks players to a site. Thus, we can hypothesize that:

H1: Playfulness will have a positive influence on stickiness.

2.3 Habit

There is a lack of research on the online game environment relating the importance of habit in online game players’ behavior. For this reason, this study tries to find out to which extent habit determines online game players behavior.

A habit is an unconscious or automatic behavior, as opposed to intentions, or conscious behavior (Limayem et al. 2003; Ortiz de Guinea and Markus 2009; Triandis 1980). Habits differ from reflexes as, to become a habit, an activity requires learning that is composed of several factors, such as a number of short-term repetitions, reinforcement, the clarity of the situation, interest and ability to learn, and so on (Triandis 1980).

According to Ajzen (2002), habitual behavior is defined by past behavior: the more frequently a behavior has been performed in the past, the stronger the habit. This is consistent with Triandis’s (1980) work. He suggested that the strength of a habit “can be measured by the frequency of occurrence of behavior.” Ajzen (2002), on the other hand, suggested that the frequency of past behavior, the number of times that the past behavior has been performed, is not an indicator of habitual behavior. He suggested that it is very difficult to demonstrate when the strength of a habit is related to frequent behavior. Furthermore, he emphasized that conscious control is an important issue that has an effect on habitual behavior. Individuals always use deliberation in their decision to take a given action. This perspective, using reasoning, is consistent with the theory of reasoned action (Fishbein and Ajzen 1975). Verplanken et al.

(1997) emphasized that when behavior is performed repeatedly and becomes habitual it may lose its reasoned-based antecedents. Rather than reasoning, habitual behavior is based on goal-oriented behavior (Ortiz de Guinea and Markus 2009).

As the prior research suggests, habit is more goal oriented than reasoned oriented. Individuals are able to perform a task based on their past experience. Stickiness is a good measure of site performance. If the users revisit the site and their visits last a long time, these characteristics may indicate that the users are committed to that site. Thus, we believe that, in the online game environment, goal-directed behavior plays an important role and is one of the driving forces that attract players. Drawing upon this literature, we posit:

H2: Habit will have a positive effect on stickiness.

2.4 Social cohesion

Cohesion is a process reflected in a group's orientation to stick together and be cohesive when performing a task. Social cohesion theory explains causally interrelated phenomena of individual- and group-level interactions. Group cohesion describes individuals' attraction to the group (Friedkin 2004; Hsu and Lu 2007). According to the research, the concept of cohesion still lacks a clear and common definition of the construct (Bollen and Hoyle 1990). As Friedkin (2004) stated, the literature on social cohesion has become increasingly confused as a result of the proliferation of definitions of social cohesion. Combining or reconciling different definitions to develop a comprehensive view of cohesion has proved to be difficult. In this study, we perceive social cohesion as an important group characteristic of online game communities that promotes online relationships among the users, facilitates the sense of togetherness, shares a common interest, and satisfies users' need for entertainment.

Groups are cohesive when they arouse positive membership attitudes and behaviors and when group members' interpersonal interactions aim to maintain these operations (Friedkin 2004; Lott and Lott 1965). Thus, cohesive groups are typically self-maintaining and include a strong membership attraction and attachment (Friedkin 2004). Prior research has characterized cohesion as "attraction to the group" (Festinger et al. 1950), the "sticking togetherness" of the group (Bollen and Hoyle 1990, 482; Gross and Martin 1952), "come to stick together in groups" (Bollen and Hoyle 1990, 482; Hartmann 1981, 257), or "the tendency for a group to stick together and remain united in the pursuit of its goals and objectives" (Bollen and Hoyle 1990, 482; Carron 1982, 124). Festinger et al.'s (1950) definition influenced the formulation of the Gross Cohesiveness Scale (Schutz 1966), which is the most widely used cohesion measure in the literature (Johnson and Fortman 1988; Stokes 1983). Cohesion researchers have extensively studied the different causes and effects of cohesion. For example, Roark and Sarah (1989) and Greene (1989) studied the antecedents of cohesion. Collins and Raven (1969), Mullen and Copper (1994), Dorfman and Stephan (1984), and Greene (1989) investigated the influence of group cohesion on productivity.

Bollen and Hoyle (1990, 482) introduced the concept of perceived cohesion, defining it as "an individual's sense of belonging to a particular group and his or her feelings of morale associated with membership in the group." The definition of the concept also depends on the context, such as small group level or society level (Chan et al. 2006; Friedkin 2004). Therefore, cohesion research has presented multitudes of differing explanatory factors to describe the antecedents and consequences of this concept. According to Hsu and Lu (2007), group cohesion is linked to positive interpersonal relations, the degree of commitment, communication, interactions, and group performance. Furthermore, the researchers found that group cohesion is an important element in online game communities. This research used research questions adapted from Hsu and Lu's (2007) work.

Manninen and Kujanpää (2007) suggested that the pull toward social play activity can be seen as one of the driving forces behind the evolution of multiplayer online game worlds. People seem to be happier if there are others present, compared to how they feel alone. Manninen and Kujanpää (2007) argued that, if

the online game is played with other people, the social interplay is enhanced by numerous traditions that are inherent in the interactions of the physical world. The social bonding is so strong that it may become one of the most important motivating factors for people to play online games. Drawing upon the literature, we posit:

H3: Social cohesion will have a positive influence on stickiness.

2.5 Social identification

Social identity theory explores intergroup relations, group processes, and the social self (Hogg et al. 1995). According to Ashforth and Mael (1989, 21), “social identification provides a partial answer to the question, Who am I?” Tajfel (1974, 69) defined the concept of social identity as “that part of an individual’s self-concept which derives from his knowledge of his membership of a social group (or groups) together with the emotional significance attached to that membership”. Bollen and Hoyle (1990) and Friedkin (2004) suggested that an individual’s attitude, strong membership attraction and attachments, positive membership attitude, and sense of belonging to a particular group drive social cohesion.

Morahan-Martin and Schumacher (2000) have researched social confidence in the online context. In their study, they observed pathological Internet users. The researchers’ definition of social confidence describes, for example, a person’s ability to make friends online, compared with the real world, or escapism from real-world pressures.

In this study, the reference group is the online game community. A person’s membership in some particular group brings him respect compared with other groups. Relatively higher-status groups bring a positive identity to group members (Ellemers et al. 1988). Han et al. (2007, 3) described this identification as a “process whereby individuals see themselves as one with another person or group of people.” According to Ellemers (1999), cognitive, evaluative, and emotional components illustrate a person’s social identity. Therefore, we can hypothesize that:

H4: Social identification will have a positive influence on social cohesion.

2.6 Social need

Parsons (2005) found in his research that social needs predicted excessive MMORPG¹ game play. According to him, Internet addictive behavior appears to be compensatory, meeting needs for companionship and empowerment in relationships. The Internet and game community offers compensatory meeting phenomena geared toward meeting the social needs of individuals who may experience difficulties with face-to-face relationships.

According to Han et al. (2007), Preece (2000) defined social need in a virtual community environment as “a need to receive help and support from other community members, socialize informally through synchronous and asynchronous communication, discuss and exchange ideas, form relationships, and get involved with other members.” In the context of virtual communities, Han et al. (2007) discussed that the individual’s needs can be examined using utilitarian and hedonic values, which the researchers call social needs.

Ridings and Gefen (2004) compared human motivations for joining offline communities and online communities. The researchers found that an individual’s motivation and need to be affiliated with an offline community are based on the likelihood of the community providing information and helping individuals to achieve goals and attain rewards.

Yee (2006) tried to clarify which attributes of computer game mechanisms may attract players and motivate them to play. He categorized three different motivational components that explain players’

¹ Massively multiplayer online role-playing game.

behavior: achievement, social, and immersion. Yee suggested that players who are relationship oriented want to interact with each other and develop meaningful in-game relationships (Yee 2006).

Ryan et al. (2006) applied self-determination theory to their investigation of motivations for computer game playing and the effects of game playing on well-being. The researchers employed a new measure of need satisfaction. Äkkinen (2005) suggested that an individual may join a community in order to find some peer-to-peer support but may stay in the community for other reasons, such as addiction to the Internet and to the community. Drawing upon the literature, we posit:

H5: Social need will have a positive influence on social cohesion.

2.7 Offline social interaction

In the context of this research, the offline social interaction construct can be considered a natural interaction occurring in a real-life environment or outside the virtual community itself. We included the offline social interaction variable in the study to assess the importance of offline social interaction in social cohesion. Although people play online games anonymously with their geographically distant or near players or play online games with friends they already know, players may feel offline social interaction is an important factor.

Research has suggested that spending time in an online environment with online friends may affect individuals' physical relationships. Chou et al. (2005) suggested that the online environment is a convenient place, for example, where shy or self-conscious individuals are allowed to interact in a socially safe and secure environment. Morahan-Martin and Schumacher (2000) concluded, based on an extensive literature review, that once the Internet becomes a substitute for real-life social interaction, users may be caught in a vicious cycle.

Kraut et al. (1998) found that those who use the Internet more often became less socially involved and lonelier compared with those who use the Internet less. Heckel (2003) found that the participants in her study did not see their online friendships as different from their offline friendships. The majority of the relationships the players formed were weak and impersonal. She also suggested that online acquaintances do not hinder the formation of strong relationships after a longer period. Contrary to studies that suggest that Internet usage increases isolation, the Pew Internet and American Life Project (2000) reported that Internet usage has strengthened offline communication with family and friends.

Face-to-face groups give individuals information as well as self-identity, values, attitudes, and notions of accepted behaviors. People also seek to join virtual communities in search of these same benefits (Ridings and Gefen 2004). We expect that offline social interaction explain social cohesion. Thus, drawing upon the literature, we posit:

H6: Offline social interaction will have a positive influence on social cohesion.

3 RESEARCH METHODOLOGY AND RESULTS

Most of the questions used in this research were based on validated questions adapted from prior studies. Questions were pre-tested with twelve university students, all of who had experience with online gaming communities. Students provided feedback on the content, terminology, format, length, answer time, and instructions. The questionnaire was modified based on this feedback. The goal of the pre-test was to evaluate and increase the content validity of the instruments to be used in the online gaming communities context (Hoffer and Sraub 1989). A survey was conducted using an online questionnaire, which resulted in 250 relevant responses.

The reliability of constructs can be improved by using previously validated and tested questions (Straub, 1989; Boudreau et al., 2001). Accordingly, the items used in this research were based on validated questions adapted from prior studies (see the first column in Table 3). Social identification and social

need are based on Han et al. (2007) and Parsons (2005) research. Offline social interaction was adapted from Rothaermel and Sugiyama (2001). Habit is based on the Limayem and Hirt (2003) research. Stickiness is based on the Pahnla (2006) research, and playfulness is adapted from Moon and Kim research (2001). All of the items in the instrument were measured using a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). The study was registered on ten online gaming communities' sites. A notice was placed on online message boards to encourage players to participate in the survey. The notice also outlined the study objective and provided a link to the actual online questionnaire. Responses were collected using the Web based questionnaire. Majority of the respondents were male (N=231, 92.4%). Age distribution shows that 45.2% of the respondents were less than 22 years old and 47.2% belong the group 22-31. The number of female was 19 (7.6%). Table 2 shows the descriptive statistics of the sample. Respondents played an average of 3.4 hours (median 3.0, standard deviation 2.4) per session and 6.6 sessions (median 5.0, standard deviation 4.5) per week.

4 THE MEASUREMENT MODEL

The descriptive statistics of the study were analyzed using the SPSS 16.0 software package. Data analysis was conducted using the Smart Partial Least Squares (PLS) structural equation modeling technique (Ringle and Wende 2005). PLS is widely used and accepted in different contexts and disciplines (Kleijnen et al. 2007; Limayem et al. 2000; Venkatesh et al. 2003). PLS is a powerful path modeling procedure because of its minimal demands on measurement scales (i.e., both category- and ratio-level indicators can be used in the same model), sample size, and residual distributions (Chin and Newsted 1999; Simon and Bruce 1991). PLS was used in this study as an alternative to covariance-based and explanatory structure equation model (SEM) techniques such as LISREL or Amos. We selected component-based Smart PLS instead of covariance-based LISREL or Amos because of the nature of the research. This research is more predictive than confirmatory theory testing by nature.

Convergent and discriminant validity was assessed. Convergent validity indicates whether the indicators represent the same factor. Convergent validity was ensured by assessing the factor loadings and by calculating the variance extracted. As Table 3 shows, all of the model items loaded well and exceeded 0.50 (Hair et al. 2006), except in the cases of Sticky2 and Play5, which were dropped. Average variance extracted (AVE) indicates the latent variable's ability to explain the variance of its indicators. AVE should be greater than 0.50, which indicates that the latent variable explains more construct-related variance than error variance (Fornell and Larcker 1981; Hair et al. 1998). Table 3 reports that the variance extracted from all the constructs exceeded 0.50. The internal consistency and reliability among the indicators were assessed by calculating Cronbach's alpha and the composite reliability. Table 3 also shows that Cronbach's alpha coefficient exceeds the suggested value of 0.60 for all constructs (Hair et al. 2006; Nunnally 1978). The composite reliability of all of the constructs exceeded the suggested value of 0.7 (Nunnally 1978).

Construct	Items	Factor loadings	Average variance extracted	Cronbach's alpha	Composite reliability
Stickiness (Pahnla 2006)	Sticky1	0.614	0.563	0.802	0.864
	Sticky2	Dropped			
	Sticky3	0.811			
	Sticky4	0.824			
	Sticky5	0.786			
	Sticky6	0.695			
Playfulness (Moon and Kim 2001)	Play1	0.859	0.591	0.767	0.851
	Play 2	0.698			
	Play 3	0.810			
	Play 4	0.694			

	Play 5	Dropped			
Social cohesion	Cohes1	0.845	0.708	0.792	0.879
(Hsu and Lu 2007)	Cohes2	0.893			
	Cohes3	0.782			
Habit	Habit1	0.807	0.572	0.819	0.870
(Limayem and	Habit2	0.769			
Hirt 2003)	Habit3	0.711			
	Habit4	0.698			
	Habit5	0.792			
Social identification	Ident1	0.871	0.721	0.903	0.928
(Han et al. 2007)	Ident2	0.819			
(Parsons 2005)	Ident3	0.852			
	Ident4	0.889			
	Ident5	0.814			
Social need	Need1	0.874	0.684	0.881	0.914
(Han et al. 2007)	Need2	0.921			
(Parsons 2005)	Need3	0.882			
	Need4	0.776			
	Need5	0.651			
Offline interaction	Offl1	0.956	0.904	0.948	0.966
(Rothaermel and	Offl 2	0.935			
Sugiyama 2001)	Offl 3	0.961			

Table 3 Convergent Validity, Internal Consistency, and Reliability

Discriminant validity tests the extent to which the constructs, which should not correlate with each other, are not correlative. Discriminant validity was assessed by computing the correlations between all construct pairs, calculating the square root of the average variance extracted, and calculating the cross-loadings of the items. All of the cross-correlations were below the threshold value of 0.90 (Hair et al. 1998). The square root of average variance extracted should usually be greater than the pair-wise correlations of the constructs. The number of items, mean, standard deviation, and correlations of the constructs, as well as the square roots of the average variance extracted (bolded), are displayed in Table 4. As shown in Table 4, the square root of the variance extracted from all of the constructs is larger than all other cross-correlations.

Construct	Number of items	Mean	Standard deviation	1.	2.	3.	4.	5.	6.	7.
1. Stickiness	5	5.40	1.05	0.750						
2. Playfulness	4	5.48	0.86	0.667	0.769					
3. Habit	5	4.41	1.37	0.623	0.538	0.756				
4. Social cohesion	3	4.62	1.20	0.376	0.361	0.324	0.841			
5. Social need	5	3.38	1.55	0.256	0.335	0.311	0.573	0.827		
6. Social identification	5	4.25	1.40	0.466	0.411	0.377	0.676	0.618	0.849	
7. Offline interaction	3	3.66	2.05	0.090	0.050	0.088	0.281	0.260	0.260	0.951

Table 4 The Mean, Standard Deviation, and Correlations of the Constructs

Note: The diagonal bolded elements are square roots of the average variance extracted.

We also assessed the loadings and cross-loadings of the items on their constructs. Items loaded more strongly to their own factor than to any other factor. Hence, the reliability and validity of the constructs in the model were acceptable, which confirmed that the operationalization was successful.

5 THE RESEARCH MODEL

The research model and the results are displayed in Figure 1, which shows the estimated path coefficients and the significance of the path (indicated with asterisks). Tests of significance were performed using the bootstrapping procedure. Bootstrapping t-test values are indicated below the path coefficient value. Standardized betas show that social identification ($\beta = 0.507$), social need ($\beta = 0.237$), and offline social interaction ($\beta = 0.088$) have a significant influence on social cohesion. Further, social cohesion has a significant influence on stickiness ($\beta = 0.106$). Moreover, both playfulness ($\beta = 0.439$) and habit ($\beta = 0.353$) have a significant influence on stickiness. Overall, the research model accounts for 55.3% ($R^2 = 0.553$) of the variance in stickiness and 50.3% ($R^2 = 0.503$) in cohesion.

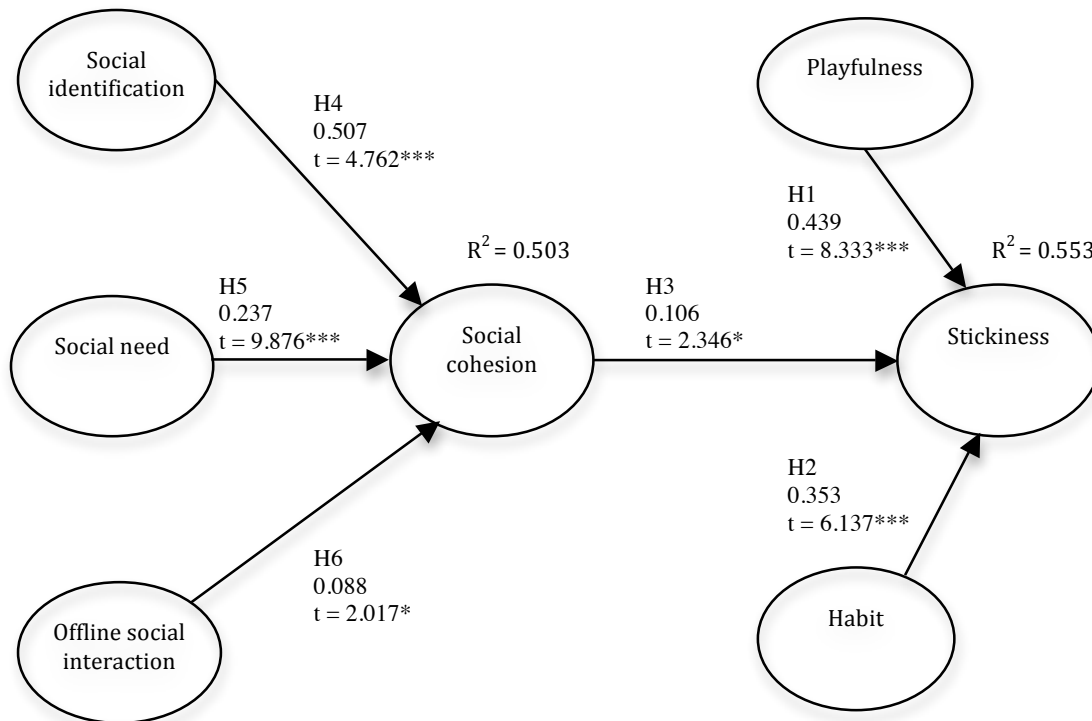


Figure 1. The research model

Notes: * = 0.05 level, ** = 0.01 level, *** = 0.001

6 DISCUSSIONS AND CONCLUSION

As the result show, joining the online gaming community encourages players' social identification with the online gaming community. People identify with the values of the community, and joining the group makes them feel satisfied and proud to identify with it. They project and build their self-esteem through belonging to the community they respect and assume others value the community as well. Social need is perceived to interact strongly with social cohesion. Hence, the possibility of making new (online) friends, interacting and communicating with the online gaming community friends, and being closer to these friends can have important implications for a person's social confidence and identification development,

as well as for the intensification of the virtual group's cohesion. Results show offline social interaction has a significant influence on social cohesion. It may indicate, that people join online gaming communities to interact with others, to make new friends, or to be closer to existing friends. People might join a virtual online gaming community to meet the need for escapism from real life or the suitability of an online gaming community as a medium for making friends in physical life. This indicates that people who interact and communicate in virtual online gaming communities also communicate face-to-face, and offline social interaction with friends can have important implications for social cohesion. This finding is consistent with Katz and Aspden's (1997) findings. Thus, people living geographically close to one another are interested in participating in virtual online gaming communities to engage in face-to-face communication and strengthen their friendships. Kraut et al. (1998) suggested that people use the Internet mainly for interpersonal communication and that the relationships developed online formulate weak ties. In the physical world, strong ties are based on physical proximity, which is not possible in online interaction (Kraut et al. 1998).

Results, however, also show that difficulties in establishing social relationships in the real world can drive people to join online gaming communities. The community could be a good medium for social communication for those who, for some reason, have difficulty establishing face-to-face communication with others. By joining the virtual online gaming community, people gain social confidence, feel free, or can perceive that virtual life is a choice to escape the pressures of real life. Playfulness, social cohesion, and habit together explain close to 55% of stickiness.

Playfulness was shown to have a significant effect on stickiness. This is consistent with the findings of Lin et al. (2005) and Lu and Wang (2008). People's motivations for joining and belonging to an online game community are expressed by the strength of their emotions of playfulness the community arouses through interaction with the players. When the community succeeds in this aim, the players feel that they are totally absorbed in gaming and forget the elapsed time, as well as their surroundings. They experience a sense of escapism. The influence of habits on behavior increases in the long run, as stated earlier. To get players into the habit of playing an online game, we suggest that the game itself should offer incentives and challenges for players. Playfulness indicates a longer-lasting intrinsic motivational state, rather than an occasional state. Playfulness is a relatively stable characteristic that is positively related to satisfaction and computer involvement (Webster and Martocchio 1992). Moon and Kim (2001) suggested that considering playfulness will increase the usability of the World Wide Web. Therefore, we emphasize that online game developers should understand the importance of intrinsic motivation in the interface and system design.

Social cohesion has a significant effect on stickiness. Members of an online gaming community express the social cohesion aspect by how well they feel they fit into the specific community or how much they like the other members of this community. Habit was also found to have a strong impact on stickiness. This interdependence clearly shows how online gaming had become a self-evident custom (habit) for the respondents. In some cases, it could even be described as a compulsive and pathological way of action (Morahan-Martin and Schumacher 2000).

This study showed that playfulness, habit, and social cohesion are important constructs in explaining online gaming stickiness. This may refer to the feelings of pleasure when users have managed to reach their goal or managed to solve a problem using the online game. In terms of the effects of perceived playfulness, the significant result obtained for frequency of Internet usage and daily Internet usage are expected because, if an activity is enjoyable, it is likely to be indulged in more frequently and for a longer time each game event. Our results show that, in the online game environment, goal-directed behavior (habit) plays an important role and is one of the driving forces that stick players. Social cohesion, belonging to a group, and playing together in an online gaming environment give users an experience of satisfaction.

7 LIMITATIONS

This study assessed the factors that have an impact on stickiness in online game communities. The study also raised some cautions in interpreting the results. The field study was conducted on the web using a fill-in form and was based on self-reporting data, which leaves the possibility of method bias. Major concerns often mentioned in the context of World Wide Web surveys are the reliability and validity of the questions. On the other hand, taking into consideration that our focus group was online game players, it was natural that we gathered the data using the web. The survey respondents were representatives of several nationalities. We did not compare the differences in responses between the different nationalities. It is possible that cultural issues could have had an effect on the research focus. According to the responses, respondents were interested in various online games, and most of the respondents played different online games. The depth of social interaction, identification, and/or social cohesion varies across online game communities. All these issues should be taken into consideration when assessing the generalizability of the results. As discussed earlier, the influence of habits on behavior increases in the long run (Limayem et al. 2003). Considering that this research is a cross-sectional study by nature, it could be that if the designers and developers do not manage to maintain players' interests the influence of habit may decrease in the long run.

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